

Attachment 9

RCRA Part B Permit Application

Groundwater Monitoring Information

US Ecology Tulsa, Inc.

EPA ID: OKD000402396



Tulsa, Oklahoma

Permit Application

July 12, 2022

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2. Copy of most recent Groundwater Monitoring Report.....ix-1

**1. APPLICABILITY OF GROUNDWATER MONITORING REQUIREMENTS: 40
CFR 270.14(c)(1)**

Groundwater monitoring requirements referenced by Part B permit application requirements of 40 CFR 270.14(c)(1) apply to owners and operators of surface impoundments, landfills, or land treatment facilities used for management of hazardous waste. US Ecology Tulsa, Inc. (USE Tulsa) does not operate any surface impoundment, landfill, or land treatment units; therefore, this section does not apply to USE Tulsa. Hazardous constituents have been detected at compliance points, and groundwater is monitored under the requirements of a Corrective Measures Study dated April 8, 1998. To date, no hazardous constituents have been detected off-site, and the hazardous constituents that have been previously detected on-site to show minimal groundwater impairment. The most recent sampling analysis shows no site contamination.

2. COPY OF MOST RECENT GROUNDWATER MONITORING REPORT

The following report is the most recent annual groundwater monitoring report from Arcadis conducted on December 9th, 2021.

US Ecology Tulsa, Inc.

2021 ANNUAL GROUNDWATER MONITORING REPORT

February 15, 2022

A large, solid orange geometric shape, resembling a right-angled triangle or a trapezoid, is positioned in the bottom right corner of the page. It is oriented with its hypotenuse facing upwards and to the right. A thin white diagonal line runs from the bottom-left corner of this shape towards the top-right corner. A thin white horizontal line intersects the shape near its base, extending from the left edge of the page.

2021 ANNUAL GROUNDWATER MONITORING REPORT



Tom Kolb
Project Manager



Michael M. Gates
Project Advisor

Prepared for:

US Ecology Tulsa, Inc.
2700 South 25th West Avenue
Tulsa, Oklahoma

Prepared by:

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Our Ref.:

30061101

Date:

February 15, 2022

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1 INTRODUCTION

Arcadis, Inc. (Arcadis), on behalf of US Ecology Tulsa, Inc. has prepared this 2021 Annual Groundwater Monitoring Report for the US Ecology Tulsa, Inc. facility located at 2700 South 25th West Avenue in Tulsa, Oklahoma (Figure 1), herein referred to as the “Site”. This groundwater monitoring was specified by the Waste Management Division (WMD) of the Oklahoma Department of Environmental Quality (ODEQ) in their letter dated April 30, 1998, approving the Corrective Measures Study (CMS) Final Report and Summary. The CMS Final Report and Summary was submitted to the DEQ on April 10, 1998 in accordance with the Consent Order EH-89-130 which was incorporated into section HSWA-Q-(5) of the operating permit. On October 23, 2013, the ODEQ approved a modification to the groundwater monitoring program to reduce the frequency to annually. On February 9, 2018, the ODEQ approved a modification to the groundwater monitoring program to reduce the laboratory analysis to the constituents arsenic and nickel.

2 ANNUAL MONITORING ACTIVITIES

US Ecology Tulsa, Inc. utilizes three downgradient groundwater monitoring wells (MW-16, MW-17, and MW-18) as compliance points. In addition to the compliance wells, one upgradient monitoring well (MW-15) and an additional monitoring well (MW-12) were sampled. The locations of these five monitoring wells are shown on Figure 2.

2.1 Fluid-Level Gauging Activities

Groundwater gauging and sampling was conducted at the facility on December 9, 2021. Fluid-level measurements were collected from the above referenced compliance points using an electronic oil/water interface probe. These measurements were documented on the Arcadis Water Sampling Logs, referenced to a surveyed elevation point and transcribed into Table 1. A copy of the field notes is provided in Appendix A. A groundwater elevation map is also attached as Figure 3. The groundwater flow direction during the 2021 event is generally to the east/northeast.

2.2 Groundwater Sampling Activities

Prior to sampling, wells were purged a minimum of three well volumes or until bailed dry and allowed to recover to approximately 80% of static conditions to ensure a representative groundwater sample. US Ecology Tulsa, Inc. provided for the disposal of the purged groundwater. The wells were purged and sampled using dedicated, disposable polyethylene bailers. All groundwater samples were placed in laboratory-supplied containers, packed on ice, and shipped to ALS Environmental Laboratory in Houston, Texas for laboratory analyses. Groundwater samples were analyzed for total and dissolved metals arsenic and nickel via United States Environmental Protection Agency (USEPA) laboratory method E200.8.

Physical water quality parameters (pH, specific conductance, and temperature) were collected in the field. A copy of the field notes is provided in Appendix A.

Quality assurance/quality control (QA/QC) samples (i.e. duplicate and field blank) were prepared during the sampling event. A duplicate of monitoring well MW-15 was prepared at the time of sampling and labeled MW-19 on the chain-of-custody (COC). A field blank was prepared during the sampling event and labeled MW-20 on the COC.

At the request of the ODEQ, a photoionization detector (PID) was used to determine if any organic vapors were present prior to purging and sampling when each well cap was removed. A background reading of 0.0 ppm was determined prior to purging and sampling. There were no organic vapor readings recorded above background for any of the monitoring wells.

2.3 Laboratory Analytical Results

Laboratory analytical results, provided by ALS, are summarized in Table 2. A copy of the original laboratory report and the chain-of-custody form are also included in Appendix B.

Groundwater samples were analyzed for total and dissolved arsenic. Total arsenic was detected in all of the monitoring wells sampled; MW-12 (0.0879 mg/L), MW-15 (0.0299 mg/L), MW-16 (0.186 mg/L), MW-17 (0.00379 mg/L), and MW-18 (0.00348). The total arsenic concentration in MW-12, MW-15, and MW-16 exceeded the established arsenic Maximum Contaminant Level (MCL) of 0.01 mg/L. Dissolved arsenic was detected in only two of the monitoring wells sampled; MW-12 (0.00951 mg/L) and MW-18 (0.00229) and are both below the established arsenic MCL. As discussed with ODEQ in the past, background concentrations of arsenic in groundwater are often elevated in this part of Oklahoma due to interference from soil in the form of suspended solids that contain naturally occurring arsenic. These total and dissolved arsenic concentration results provide support for this conclusion.

Groundwater samples were analyzed for total and dissolved nickel. The total nickel concentration in the sampled wells ranged from 0.00996 mg/L to 0.138 mg/L. The dissolved nickel concentration in the sampled wells ranged from 0.00794 mg/L to 0.127 mg/L. There is currently no primary drinking water standard established by the USEPA for nickel. The MCL for nickel was remanded by the USEPA on February 9, 1995. However, the sampling results for nickel are all below the current USEPA Regional Screening Level (RSL) of 0.390 mg/L for nickel in tapwater.

3 CONCLUSIONS

The annual groundwater monitoring conducted to comply with the ODEQ compliance monitoring program includes two (2) Chemicals of Potential Concern (CoPCs): arsenic and nickel.

The results for total and dissolved arsenic in three of the sampled wells provides evidence that the exceedances of the arsenic MCL is likely due to the presence of suspended solids of native soil that has been reported to have elevated concentrations of naturally occurring arsenic in this area of Oklahoma.

Historically, concentrations of arsenic in each of the monitoring wells that are sampled have shown variability. Based on the analytical results since 1998, arsenic concentrations in each well have ranged from non-detect to levels exceeding compliance goals. These variations are thought to be due to the presence of suspended soil fractions in the form of turbidity in the collected sample. The presence of turbidity can vary significantly between sampling events. When these groundwater samples are analyzed for *total* metals, the results will yield concentrations of metals dissolved in groundwater along with

concentrations that may occur naturally in soil. This is a common problem, particularly for arsenic, in Oklahoma. For several years, Arcadis has included an analysis of dissolved metals in addition to total metals. The results demonstrate that the presence of arsenic is likely due to its natural presence in soil since in most cases the dissolved fraction has been significantly lower.

The correlation observed between dissolved and total arsenic concentrations was not observed for nickel. The dissolved nickel concentrations were in some cases lower, but unlike arsenic, no correlation was evident. When the requirements for this compliance monitoring program were developed over 25 years ago, nickel had an established MCL of 0.1 mg/L. The MCL for nickel was remanded by the USEPA on February 9, 1995. However, the current USEPA RSL for nickel in tapwater is 0.390 mg/L. All of the nickel results for the 2021 sampling event are below this RSL.

TABLES



Table 1
Summary of Fluid-Level Measurements
US Ecology Tulsa, Inc.
Tulsa, Oklahoma



Well Number	Date Collected	Total Depth (ft bTOC)	TOC Elevation (ft bTOC)	Depth to Water (ft bTOC)	Water-Level Elevation (ft bTOC)	pH	Specific Conductance (μS/cm)	Temperature (°C)
MW-12	12/9/2021	16.60	638.02	5.11	632.91	6.65	3,250	18.0
MW-15	12/9/2021	14.95	637.27	3.41	633.86	6.35	2,970	18
MW-16	12/9/2021	16.60	636.62	3.42	633.20	6.42	5,000	16.5
MW-17	12/9/2021	16.00	636.92	3.95	632.97	6.62	3,220	16.7
MW-18	12/9/2021	14.10	634.65	2.16	632.49	6.45	1,958	18.5

bTOC Below Top of Casing
 > Greater than

Table 2
Summary of Groundwater Analytical Results
US Ecology Tulsa, Inc.
Tulsa, Oklahoma



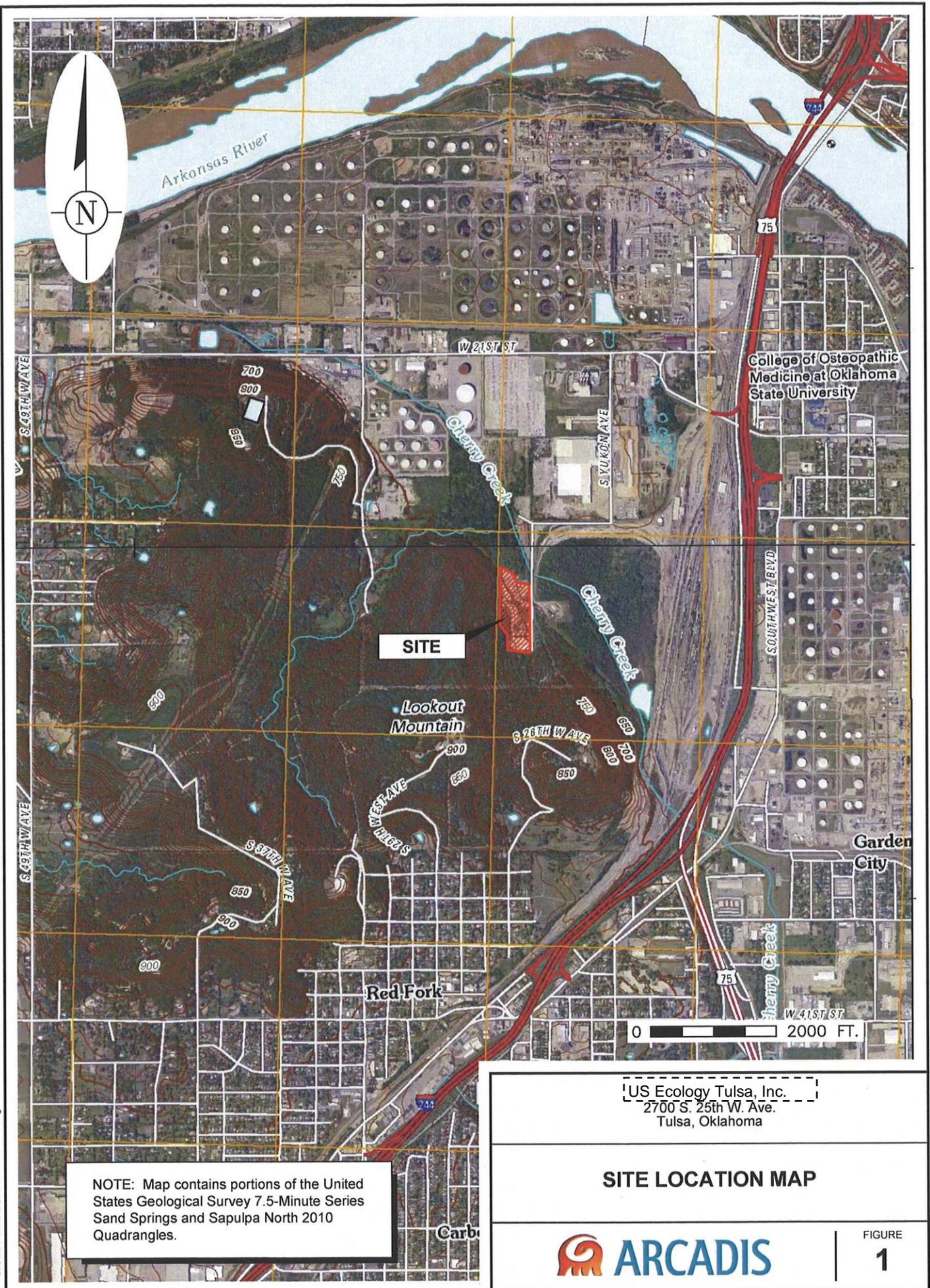
Well Number	Date Collected	Total Arsenic (mg/L)	Dissolved Arsenic (mg/L)	Total Nickel (mg/L)	Dissolved Nickel (mg/L)
MCLs		0.01	N/A	N/A	N/A
MW-12	12/9/21	0.0879	0.00951	0.0438	0.0389
MW-15	12/9/21	0.0299	<0.002	0.138	0.127
MW-16	12/9/21	0.186	<0.002	0.09910	0.108
MW-17	12/9/21	0.00379	<0.002	0.0888	0.0888
MW-18	12/9/21	0.00348	0.00229	0.00996	0.00794
MW-19*	12/9/21	0.0254	<0.002	0.137	0.138
MW-20**	12/9/21	<0.00200	<0.00200	<0.00200	<0.00200

MCL Maximum Concentration Limit.
mg/L Milligrams per liter.
mg/L Micrograms per liter.
< Less than.
J Analyte was detected below the quantitation limit.
* Duplicate of MW-15.
** Field Blank
Bolded values exceed the MCL.

FIGURES



CITY/Tulsa, OK DIV/GROUP/Environmental DB/B.DeHoy P.M.M. Gates
G:\STAFF\WIB\EC\Final\Site Location.dwg LAYOUT: SITE LOC SAVED: 1/14/2011 11:52 AM PLOTTED: 1/14/2011 11:53 AM BY: PERSCHNICK, KATHY



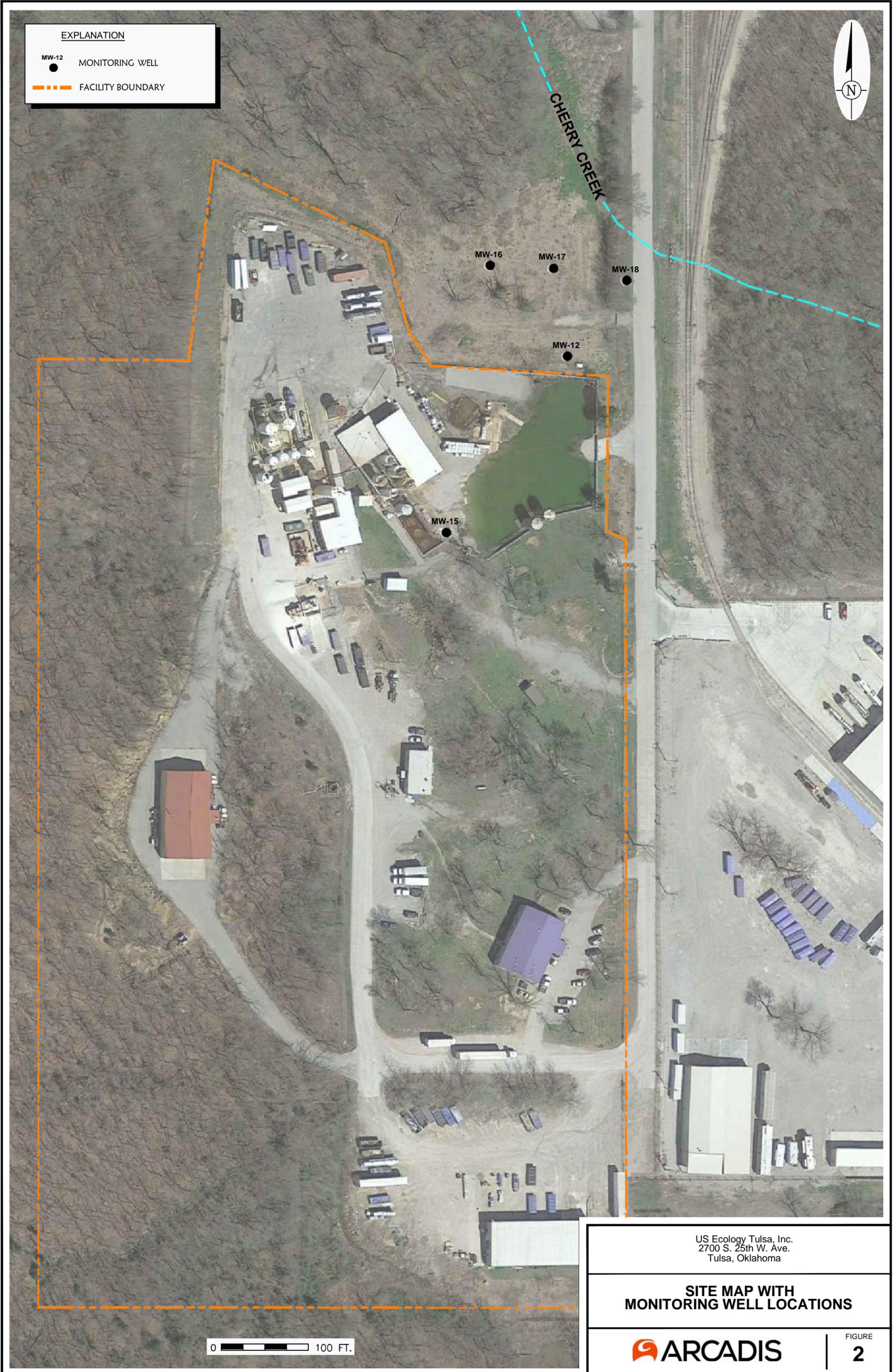
NOTE: Map contains portions of the United States Geological Survey 7.5-Minute Series Sand Springs and Sapulpa North 2010 Quadrangles.

US Ecology Tulsa, Inc.
2700 S. 25th W. Ave.
Tulsa, Oklahoma

SITE LOCATION MAP

 **ARCADIS**

FIGURE
1





APPENDIX A

Field Notes



ARCADIS

Water Sampling Log

Project US Ecology Project No. 30009304 Page 1 of 7
 Site Location TULSA OK Date 12-9-21
 Site/Well No. MW-16 Replicate No. / Code No. /
 Weather clear Sampling Time: Begin End 1300

Evacuation Data	Field Parameters
Measuring Point <u>N TOC</u>	Color <u>Tan</u>
MP Elevation (ft) <u> </u>	Odor <u> </u>
Land Surface Elevation (ft) <u> </u>	Appearance <u>sl turbid</u>
Sounded Well Depth (ft bmp) <u>16.60</u>	pH (s.u.) <u>6.38 / 6.41 / 6.42</u>
Depth to Water (ft bmp) <u>342</u>	Conductivity (mS/cm) <u>4.99 / 5.01 / 5.00</u>
Water-Level Elevation (ft) <u> </u>	(umhos/cm) <u> </u>
Water Column in Well (ft) <u>13.18</u>	Turbidity (NTU) <u>NA</u>
Casing Diameter/Type <u>2" PVC</u>	Temperature (°C) <u>16.4 / 16.5 / 16.5</u>
Gallons in Well <u> </u>	Dissolved Oxygen (mg/L) <u>NA</u>
Gallons Pumped/Bailed Prior to Sampling <u>6</u>	Salinity (%) <u>NA</u>
Sample Pump Intake Setting (ft bmp) <u>NA</u>	Sampling Method <u>Disp. Bailor</u>
Purge Time begin <u> </u> end <u> </u>	Remarks <u>Headspace = 0.10 ppm</u>
Pumping Rate (gpm) <u>NA</u>	<u>Old Tag # 30819</u>
Evacuation Method <u>Bailor</u>	<u>New Tag # 30096</u>

Constituents Sampled	Container Description	Number	Preservative
<u>Diss metals</u>	<u>poly</u>	<u>1</u>	<u>4¹⁰</u>
<u>Total metals</u>	<u>poly</u>	<u>1</u>	<u>HNO3</u>

Sampling Personnel *[Signature]*

Well Casing Volumes

Gal./Ft.	1-1/4" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.09	2-1/2" = 0.26	3-1/2" = 0.50	6" = 1.47

- bmp below measuring point
- °C Degrees Celsius
- ft feet
- gpm Gallons per minute
- mg/L Milligrams per liter
- ml milliliter
- mS/cm Milisiemens per centimeter
- msl mean sea-level
- N/A Not Applicable
- NM Not Measured
- NTU Nephelometric Turbidity Units
- PVC Polyvinyl chloride
- s.u. Standard units
- umhos/cm Micromhos per centimeter
- VOC Volatile Organic Compounds

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Water Sampling Log

Project US Ecology Project No. 30109309 Page 1 of 1
 Site Location Tulsa, OK Date 12-9-21
 Site/Well No. MW-17 Field Blank Replicate No. MW-20 @ 1220 Code No. _____
 Weather clear Sampling Time: Begin _____ End 1240

Evacuation Data
 Measuring Point N TOC
 MP Elevation (ft) _____
 Land Surface Elevation (ft) _____
 Sounded Well Depth (ft bmp) 16.0
 Depth to Water (ft bmp) 3.95
 Water-Level Elevation (ft) _____
 Water Column in Well (ft) 12.05
 Casing Diameter/Type 3" PVC
 Gallons in Well 1.8
 Gallons Pumped/Bailed Prior to Sampling 5.5
 Sample Pump Intake Setting (ft bmp) N/A
 Purge Time begin _____ end _____
 Pumping Rate (gpm) _____
 Evacuation Method Bailer

Field Parameters
 Color clear
 Odor _____
 Appearance OK
 pH (s.u.) 6.54 / 6.60 / 6.62
 Conductivity (mS/cm) 3.20 / 3.20 / 3.22
 (µmhos/cm) _____
 Turbidity (NTU) NA
 Temperature (°C) 16.4 / 16.6 / 16.7
 Dissolved Oxygen (mg/L) NA
 Salinity (%) NA
 Sampling Method Dip Bailer
 Remarks Ardspec = 0.10 ppm
Id tag# 30766
New tag# 30308

Constituents Sampled	Container Description	Number	Preservative
<u>Diss Metals</u>	<u>poly</u>	<u>1</u>	<u>4°C</u>
<u>Total Metals</u>	<u>poly</u>	<u>1</u>	<u>HNO3</u>

Sampling Personnel [Signature]

Well Casing Volumes

Gal./Ft.	1-1/4" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.09	2-1/2" = 0.26	3-1/2" = 0.50	6" = 1.47

bmp below measuring point ml milliliter NTU Nephelometric Turbidity Units
 °C Degrees Celsius mS/cm Milisiemens per centimeter PVC Polyvinyl chloride
 ft feet msl mean sea-level s.u. Standard units
 gpm Gallons per minute N/A Not Applicable umhos/cm Micromhos per centimeter
 mg/L Milligrams per liter NM Not Measured VOC Volatile Organic Compounds

ARCADIS Water Sampling Log

Project US Ecology Project No. 30109309 Page 1 of 1
 Site Location Tulsa, OK Date 12-9-81
 Site/Well No. MW-18 Replicate No. _____ Code No. _____
 Weather clear Sampling Time: Begin _____ End 1200

Evacuation Data
 Measuring Point N TO C
 MP Elevation (ft) _____
 Land Surface Elevation (ft) _____
 Sounded Well Depth (ft bmp) 14.10
 Depth to Water (ft bmp) 2.16
 Water-Level Elevation (ft) _____
 Water Column in Well (ft) 11.94
 Casing Diameter/Type 2" PVC
 Gallons in Well 1.7
 Gallons Pumped/Bailed Prior to Sampling 5.5
 Sample Pump Intake Setting (ft bmp) NA
 Purge Time begin _____ end _____
 Pumping Rate (gpm) NA
 Evacuation Method Bailer

Field Parameters
 Color clear
 Odor /
 Appearance ok
 pH (s.u.) 6.19 / 6.28 / 6.45
 Conductivity (mS/cm) _____
 (umhos/cm) 1937 / 1949 / 1958
 Turbidity (NTU) NA
 Temperature (°C) 18.1 / 18.2 / 18.5
 Dissolved Oxygen (mg/L) 1.1
 Salinity (%) NA
 Sampling Method 2 1/2" Bailor
 Remarks Hd gpm = 0.0 ppm
Old Tot # 30360
New Tot # 87001

Constituents Sampled	Container Description	Number	Preservative
<u>Diss Nitrate</u>	<u>Poly</u>	<u>1</u>	<u>4^v</u>
<u>Residual</u>	<u>Poly</u>	<u>1</u>	<u>NO3</u>

Sampling Personnel [Signature]

Well Casing Volumes

Gal./Ft.	1-1/4" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.09	2-1/2" = 0.26	3-1/2" = 0.50	6" = 1.47

bmp below measuring point
 °C Degrees Celsius
 ft feet
 gpm Gallons per minute
 mg/L Milligrams per liter
 ml milliliter
 mS/cm Milisiemens per centimeter
 msl mean sea-level
 N/A Not Applicable
 NM Not Measured
 NTU Nephelometric Turbidity Units
 PVC Polyvinyl chloride
 s.u. Standard units
 umhos/cm Micromhos per centimeter
 VOC Volatile Organic Compounds

ARCADIS

Water Sampling Log

Project US Ecology Project No. 30109309 Page 1 of 1
 Site Location Tulsa, OK Date 12-9-21
 Site/Well No. MW-12 Replicate No. / Code No. _____
 Weather Clear Sampling Time: Begin _____ End 1130

Evacuation Data	Field Parameters
Measuring Point <u>NTOC</u>	Color <u>Tan</u>
MP Elevation (ft) _____	Odor <u>/</u>
Land Surface Elevation (ft) _____	Appearance <u>sl turbid</u>
Sounded Well Depth (ft bmp) <u>16.60</u>	pH (s.u.) <u>6.58 / 6.63 / 6.65</u>
Depth to Water (ft bmp) <u>5.11</u>	Conductivity (mS/cm) _____
Water-Level Elevation (ft) _____	(umhos/cm) <u>3.18 / 3.26 / 3.25</u>
Water Column in Well (ft) <u>11.49</u>	Turbidity (NTU) <u>NA</u>
Casing Diameter/Type <u>2" PVC</u>	Temperature (°C) <u>17.9 / 18.0 / 18.0</u>
Gallons in Well <u>1.75</u>	Dissolved Oxygen (mg/L) <u>NA</u>
Gallons Pumped/Bailed Prior to Sampling <u>5.5</u>	Salinity (%) <u>NA</u>
Sample Pump Intake Setting (ft bmp) <u>NA</u>	Sampling Method <u>Disc Bailer</u>
Purge Time begin _____ end _____	Remarks <u>Headframe = 0.0 ppm</u>
Pumping Rate (gpm) <u>NA</u>	<u>Old Tag # 30264</u>
Evacuation Method <u>Bailer</u>	<u>New Tag # 30031</u>

Constituents Sampled	Container Description	Number	Preservative
<u>Diss Metals</u>	<u>Poly</u>	<u>1</u>	<u>4°C</u>
<u>Total metals</u>	<u>Poly</u>	<u>1</u>	<u>HNO3</u>

Sampling Personnel [Signature]

Well Casing Volumes

Gal./Ft.	1-1/4" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.09	2-1/2" = 0.26	3-1/2" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milsiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NM	Not Measured	VOC	Volatile Organic Compounds

ARCADIS

Water Sampling Log

Project US Ecology Project No. 30/159309 Page 1 of 1
 Site Location Tuba, OK Date 12-9-21
 Site/Well No. MW-15 Replicate No. MW-19 @ 1040 Code No. _____
 Weather clear Sampling Time: Begin _____ End 1000

Evacuation Data

Measuring Point NTOC
 MP Elevation (ft) _____
 Land Surface Elevation (ft) _____
 Sounded Well Depth (ft bmp) 14.95
 Depth to Water (ft bmp) 3.41
 Water-Level Elevation (ft) _____
 Water Column in Well (ft) 11.54
 Casing Diameter/Type 2" PVC
 Gallons in Well _____
 Gallons Pumped/Bailed Prior to Sampling 5.5
 Sample Pump Intake Setting (ft bmp) NA
 Purge Time begin _____ end _____
 Pumping Rate (gpm) _____
 Evacuation Method Bailer

Field Parameters

Color 17 Tan
 Odor _____
 Appearance sl turbid
 pH (s.u.) 6.29 / 6.31 / 6.35
 Conductivity (mS/cm) _____
 (umhos/cm) 239 / 299 / 297
 Turbidity (NTU) NA
 Temperature (°C) 17.8 / 17.9 / 18.0
 Dissolved Oxygen (mg/L) NA
 Salinity (%) NA
 Sampling Method Disp. Bailer

Remarks Hdspce = 0.10 ppm
old Tag # 712 6537
New Tag # 30117

Constituents Sampled	Container Description	Number	Preservative
<u>Diss Metals</u>	<u>poly</u>	<u>1</u>	<u>4'C</u>
<u>Total Metals</u>	<u>poly</u>	<u>1</u>	<u>HNO3</u>

Sampling Personnel [Signature] [Signature]

Well Casing Volumes

Gal./Ft.	1-1/4" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-1/2" = 0.09	2-1/2" = 0.26	3-1/2" = 0.50	6" = 1.47

bmp below measuring point ml milliliter NTU Nephelometric Turbidity Units
 °C Degrees Celsius mS/cm Milisiemens per centimeter PVC Polyvinyl chloride
 ft feet msl mean sea-level s.u. Standard units
 gpm Gallons per minute N/A Not Applicable umhos/cm Micromhos per centimeter
 mg/L Milligrams per liter NM Not Measured VOC Volatile Organic Compounds

APPENDIX B

Laboratory Analytical Reports





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Houston, TX 77099
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December 27, 2021

Thomas Kolb
ARCADIS U.S., Inc.
5100 East Skelly Drive, Suite #400
Tulsa, OK 74135

Work Order: **HS21120607**

Laboratory Results for: **30109309 EQ Tulsa**

Dear Thomas Kolb,

ALS Environmental received 7 sample(s) on Dec 10, 2021 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER

Dane J. Wacasey

Client: ARCADIS U.S., Inc.
Project: 30109309 EQ Tulsa
Work Order: HS21120607

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS21120607-01	MW-15	Groundwater		09-Dec-2021 10:00	10-Dec-2021 10:10	<input type="checkbox"/>
HS21120607-02	MW-19	Groundwater		09-Dec-2021 10:40	10-Dec-2021 10:10	<input type="checkbox"/>
HS21120607-03	MW-12	Groundwater		09-Dec-2021 11:30	10-Dec-2021 10:10	<input type="checkbox"/>
HS21120607-04	MW-18	Groundwater		09-Dec-2021 12:00	10-Dec-2021 10:10	<input type="checkbox"/>
HS21120607-05	MW-17	Groundwater		09-Dec-2021 12:40	10-Dec-2021 10:10	<input type="checkbox"/>
HS21120607-06	MW-20	Groundwater		09-Dec-2021 12:20	10-Dec-2021 10:10	<input type="checkbox"/>
HS21120607-07	MW-16	Groundwater		09-Dec-2021 13:00	10-Dec-2021 10:10	<input type="checkbox"/>

Client: ARCADIS U.S., Inc.
Project: 30109309 EQ Tulsa
Work Order: HS21120607

CASE NARRATIVE

Metals by Method E200.8

Batch ID: 173863,173915

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Client: ARCADIS U.S., Inc.
 Project: 30109309 EQ Tulsa
 Sample ID: MW-15
 Collection Date: 09-Dec-2021 10:00

ANALYTICAL REPORT
 WorkOrder:HS21120607
 Lab ID:HS21120607-01
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL METALS BY E200.8, REV 5.4, 1994		Method:E200.8		Prep:E200.8 / 23-Dec-2021		Analyst: JC
Arsenic	0.0299		0.00200	mg/L	1	23-Dec-2021 20:43
Nickel	0.138		0.00200	mg/L	1	23-Dec-2021 20:43
DISSOLVED METALS BY E200.8, REV 5.4, 1994		Method:E200.8 (dissolved)		Prep:E200.8 / 22-Dec-2021		Analyst: JHD
Arsenic	ND		0.00200	mg/L	1	22-Dec-2021 16:44
Nickel	0.127		0.00200	mg/L	1	22-Dec-2021 16:44

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ARCADIS U.S., Inc.
 Project: 30109309 EQ Tulsa
 Sample ID: MW-19
 Collection Date: 09-Dec-2021 10:40

ANALYTICAL REPORT
 WorkOrder:HS21120607
 Lab ID:HS21120607-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL METALS BY E200.8, REV 5.4, 1994		Method:E200.8		Prep:E200.8 / 23-Dec-2021		Analyst: JC
Arsenic	0.0254		0.00200	mg/L	1	23-Dec-2021 20:45
Nickel	0.137		0.00200	mg/L	1	23-Dec-2021 20:45
DISSOLVED METALS BY E200.8, REV 5.4, 1994		Method:E200.8 (dissolved)		Prep:E200.8 / 22-Dec-2021		Analyst: JHD
Arsenic	ND		0.00200	mg/L	1	22-Dec-2021 16:46
Nickel	0.138		0.00200	mg/L	1	22-Dec-2021 16:46

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ARCADIS U.S., Inc.
 Project: 30109309 EQ Tulsa
 Sample ID: MW-12
 Collection Date: 09-Dec-2021 11:30

ANALYTICAL REPORT
 WorkOrder:HS21120607
 Lab ID:HS21120607-03
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL METALS BY E200.8, REV 5.4, 1994		Method:E200.8		Prep:E200.8 / 23-Dec-2021		Analyst: JC
Arsenic	0.0879		0.00200	mg/L	1	23-Dec-2021 20:47
Nickel	0.0438		0.00200	mg/L	1	23-Dec-2021 20:47
DISSOLVED METALS BY E200.8, REV 5.4, 1994		Method:E200.8 (dissolved)		Prep:E200.8 / 22-Dec-2021		Analyst: JHD
Arsenic	0.00951		0.00200	mg/L	1	22-Dec-2021 16:48
Nickel	0.0389		0.00200	mg/L	1	22-Dec-2021 16:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ARCADIS U.S., Inc.
 Project: 30109309 EQ Tulsa
 Sample ID: MW-18
 Collection Date: 09-Dec-2021 12:00

ANALYTICAL REPORT
 WorkOrder:HS21120607
 Lab ID:HS21120607-04
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL METALS BY E200.8, REV 5.4, 1994		Method:E200.8		Prep:E200.8 / 23-Dec-2021		Analyst: JC
Arsenic	0.00348		0.00200	mg/L	1	23-Dec-2021 20:49
Nickel	0.00996		0.00200	mg/L	1	23-Dec-2021 20:49
DISSOLVED METALS BY E200.8, REV 5.4, 1994		Method:E200.8 (dissolved)		Prep:E200.8 / 22-Dec-2021		Analyst: JHD
Arsenic	0.00229		0.00200	mg/L	1	22-Dec-2021 16:50
Nickel	0.00794		0.00200	mg/L	1	22-Dec-2021 16:50

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ARCADIS U.S., Inc.
 Project: 30109309 EQ Tulsa
 Sample ID: MW-17
 Collection Date: 09-Dec-2021 12:40

ANALYTICAL REPORT
 WorkOrder:HS21120607
 Lab ID:HS21120607-05
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL METALS BY E200.8, REV 5.4, 1994		Method:E200.8		Prep:E200.8 / 23-Dec-2021		Analyst: JC
Arsenic	0.00379		0.00200	mg/L	1	23-Dec-2021 20:51
Nickel	0.0888		0.00200	mg/L	1	23-Dec-2021 20:51
DISSOLVED METALS BY E200.8, REV 5.4, 1994		Method:E200.8 (dissolved)		Prep:E200.8 / 22-Dec-2021		Analyst: JHD
Arsenic	ND		0.00200	mg/L	1	22-Dec-2021 16:52
Nickel	0.0888		0.00200	mg/L	1	22-Dec-2021 16:52

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ARCADIS U.S., Inc.
 Project: 30109309 EQ Tulsa
 Sample ID: MW-20
 Collection Date: 09-Dec-2021 12:20

ANALYTICAL REPORT
 WorkOrder:HS21120607
 Lab ID:HS21120607-06
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL METALS BY E200.8, REV 5.4, 1994		Method:E200.8		Prep:E200.8 / 23-Dec-2021		Analyst: JC
Arsenic	ND		0.00200	mg/L	1	23-Dec-2021 20:54
Nickel	ND		0.00200	mg/L	1	23-Dec-2021 20:54
DISSOLVED METALS BY E200.8, REV 5.4, 1994		Method:E200.8 (dissolved)		Prep:E200.8 / 22-Dec-2021		Analyst: JHD
Arsenic	ND		0.00200	mg/L	1	22-Dec-2021 16:54
Nickel	ND		0.00200	mg/L	1	22-Dec-2021 16:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: ARCADIS U.S., Inc.
 Project: 30109309 EQ Tulsa
 Sample ID: MW-16
 Collection Date: 09-Dec-2021 13:00

ANALYTICAL REPORT
 WorkOrder:HS21120607
 Lab ID:HS21120607-07
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL METALS BY E200.8, REV 5.4, 1994		Method:E200.8		Prep:E200.8 / 23-Dec-2021		Analyst: JC
Arsenic	0.186		0.00200	mg/L	1	23-Dec-2021 20:56
Nickel	0.0991		0.00200	mg/L	1	23-Dec-2021 20:56
DISSOLVED METALS BY E200.8, REV 5.4, 1994		Method:E200.8 (dissolved)		Prep:E200.8 / 22-Dec-2021		Analyst: JHD
Arsenic	ND		0.00200	mg/L	1	22-Dec-2021 16:56
Nickel	0.108		0.00200	mg/L	1	22-Dec-2021 16:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Weight / Prep Log

Client: ARCADIS U.S., Inc.
Project: 30109309 EQ Tulsa
WorkOrder: HS21120607

Batch ID: 173446	Start Date: 11 Dec 2021 15:30	End Date: 11 Dec 2021 16:00
Method: SAMPLE FILTRATION - 0.45 MICRON FILTER		Prep Code: FILTRATION

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS21120607-01		100 (mL)	100 (mL)	1	120 mL Plastic Neat
HS21120607-02		100 (mL)	100 (mL)	1	120 mL Plastic Neat
HS21120607-03		100 (mL)	100 (mL)	1	120 mL Plastic Neat
HS21120607-04		100 (mL)	100 (mL)	1	120 mL Plastic Neat
HS21120607-05		100 (mL)	100 (mL)	1	120 mL Plastic Neat
HS21120607-06		100 (mL)	100 (mL)	1	120 mL Plastic Neat
HS21120607-07		100 (mL)	100 (mL)	1	120 mL Plastic Neat

Batch ID: 173863	Start Date: 22 Dec 2021 10:00	End Date: 22 Dec 2021 14:00
Method: DISSOLVED METALS DIGESTION BY E200.8,REV 5.4,1994		Prep Code: 200.8_DISSPR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS21120607-01		10 (mL)	10 (mL)	1	120 mL Plastic Neat
HS21120607-02		10 (mL)	10 (mL)	1	120 mL Plastic Neat
HS21120607-03		10 (mL)	10 (mL)	1	120 mL Plastic Neat
HS21120607-04		10 (mL)	10 (mL)	1	120 mL Plastic Neat
HS21120607-05		10 (mL)	10 (mL)	1	120 mL Plastic Neat
HS21120607-06		10 (mL)	10 (mL)	1	120 mL Plastic Neat
HS21120607-07		10 (mL)	10 (mL)	1	120 mL Plastic Neat

Batch ID: 173915	Start Date: 23 Dec 2021 09:00	End Date: 23 Dec 2021 16:30
Method: TOTAL METALS PREP BY E200.8, REV 5.4, 1994		Prep Code: 200.8PR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS21120607-01		10 (mL)	10 (mL)	1	120 plastic HNO3
HS21120607-02		10 (mL)	10 (mL)	1	120 plastic HNO3
HS21120607-03		10 (mL)	10 (mL)	1	120 plastic HNO3
HS21120607-04		10 (mL)	10 (mL)	1	120 plastic HNO3
HS21120607-05		10 (mL)	10 (mL)	1	120 plastic HNO3
HS21120607-06		10 (mL)	10 (mL)	1	120 plastic HNO3
HS21120607-07		10 (mL)	10 (mL)	1	120 plastic HNO3

Client: ARCADIS U.S., Inc.
Project: 30109309 EQ Tulsa
WorkOrder: HS21120607

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 173863 (0)		Test Name : DISSOLVED METALS BY E200.8, REV 5.4, 1994			Matrix: Groundwater	
HS21120607-01	MW-15	09 Dec 2021 10:00		22 Dec 2021 14:00	22 Dec 2021 16:44	1
HS21120607-02	MW-19	09 Dec 2021 10:40		22 Dec 2021 14:00	22 Dec 2021 16:46	1
HS21120607-03	MW-12	09 Dec 2021 11:30		22 Dec 2021 14:00	22 Dec 2021 16:48	1
HS21120607-04	MW-18	09 Dec 2021 12:00		22 Dec 2021 14:00	22 Dec 2021 16:50	1
HS21120607-05	MW-17	09 Dec 2021 12:40		22 Dec 2021 14:00	22 Dec 2021 16:52	1
HS21120607-06	MW-20	09 Dec 2021 12:20		22 Dec 2021 14:00	22 Dec 2021 16:54	1
HS21120607-07	MW-16	09 Dec 2021 13:00		22 Dec 2021 14:00	22 Dec 2021 16:56	1
Batch ID: 173915 (0)		Test Name : TOTAL METALS BY E200.8, REV 5.4, 1994			Matrix: Groundwater	
HS21120607-01	MW-15	09 Dec 2021 10:00		23 Dec 2021 13:00	23 Dec 2021 20:43	1
HS21120607-02	MW-19	09 Dec 2021 10:40		23 Dec 2021 13:00	23 Dec 2021 20:45	1
HS21120607-03	MW-12	09 Dec 2021 11:30		23 Dec 2021 13:00	23 Dec 2021 20:47	1
HS21120607-04	MW-18	09 Dec 2021 12:00		23 Dec 2021 13:00	23 Dec 2021 20:49	1
HS21120607-05	MW-17	09 Dec 2021 12:40		23 Dec 2021 13:00	23 Dec 2021 20:51	1
HS21120607-06	MW-20	09 Dec 2021 12:20		23 Dec 2021 13:00	23 Dec 2021 20:54	1
HS21120607-07	MW-16	09 Dec 2021 13:00		23 Dec 2021 13:00	23 Dec 2021 20:56	1

Client: ARCADIS U.S., Inc.
Project: 30109309 EQ Tulsa
WorkOrder: HS21120607

QC BATCH REPORT

Batch ID: 173863 (0) **Instrument:** ICPMS06 **Method:** DISSOLVED METALS BY E200.8, REV 5.4, 1994 (DISSOLVED)

MBLK		Sample ID: MBLKF2-173863	Units: ug/L			Analysis Date: 22-Dec-2021 16:20				
Client ID:		Run ID: ICPMS06_398186	SeqNo: 6436483	PrepDate: 22-Dec-2021	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	2.00								
Nickel	ND	2.00								

MBLK		Sample ID: MBLKF1-173863	Units: ug/L			Analysis Date: 22-Dec-2021 16:18				
Client ID:		Run ID: ICPMS06_398186	SeqNo: 6436482	PrepDate: 22-Dec-2021	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	2.00								
Nickel	ND	2.00								

MBLK		Sample ID: MBLK-173863	Units: ug/L			Analysis Date: 22-Dec-2021 16:16				
Client ID:		Run ID: ICPMS06_398186	SeqNo: 6436481	PrepDate: 22-Dec-2021	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	2.00								
Nickel	ND	2.00								

LCS		Sample ID: LCS-173863	Units: ug/L			Analysis Date: 22-Dec-2021 16:22				
Client ID:		Run ID: ICPMS06_398186	SeqNo: 6436484	PrepDate: 22-Dec-2021	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	52.14	2.00	50	0	104	85 - 115				
Nickel	53.1	2.00	50	0	106	85 - 115				

MS		Sample ID: HS21120846-01MS	Units: ug/L			Analysis Date: 22-Dec-2021 16:26				
Client ID:		Run ID: ICPMS06_398186	SeqNo: 6436486	PrepDate: 22-Dec-2021	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	51.63	2.00	50	0.029	103	85 - 115				
Nickel	52.67	2.00	50	0.71	104	85 - 115				

Client: ARCADIS U.S., Inc.
Project: 30109309 EQ Tulsa
WorkOrder: HS21120607

QC BATCH REPORT

Batch ID: 173863 (0) **Instrument:** ICPMS06 **Method:** DISSOLVED METALS BY E200.8, REV 5.4, 1994 (DISSOLVED)

MSD Sample ID: **HS21120846-01MSD** Units: **ug/L** Analysis Date: **22-Dec-2021 16:28**
 Client ID: Run ID: **ICPMS06_398186** SeqNo: **6436487** PrepDate: **22-Dec-2021** DF: **1**
 Analyte Result PQL SPK Val SPK Ref Value %REC Control Limit RPD Ref Value %RPD RPD Limit Qual

Arsenic	52.68	2.00	50	0.029	105	85 - 115	51.63	2	20
Nickel	53.55	2.00	50	0.71	106	85 - 115	52.67	1.67	20

The following samples were analyzed in this batch:

HS21120607-01	HS21120607-02	HS21120607-03	HS21120607-04
HS21120607-05	HS21120607-06	HS21120607-07	

Client: ARCADIS U.S., Inc.
Project: 30109309 EQ Tulsa
WorkOrder: HS21120607

QC BATCH REPORT

Batch ID: 173915 (0) **Instrument:** ICPMS06 **Method:** TOTAL METALS BY E200.8, REV 5.4, 1994

MBLK		Sample ID: MBLK-173915		Units: ug/L		Analysis Date: 23-Dec-2021 20:01				
Client ID:		Run ID: ICPMS06_398310		SeqNo: 6439065		PrepDate: 23-Dec-2021		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	ND	2.00								
Nickel	ND	2.00								

LCS		Sample ID: LCS-173915		Units: ug/L		Analysis Date: 23-Dec-2021 20:04				
Client ID:		Run ID: ICPMS06_398310		SeqNo: 6439066		PrepDate: 23-Dec-2021		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	50.5	2.00	50	0	101	85 - 115				
Nickel	52.69	2.00	50	0	105	85 - 115				

MS		Sample ID: HS21120909-07MS		Units: ug/L		Analysis Date: 23-Dec-2021 20:13				
Client ID:		Run ID: ICPMS06_398310		SeqNo: 6439071		PrepDate: 23-Dec-2021		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	44.7	2.00	50	4.038	81.3	70 - 130				
Nickel	39.75	2.00	50	0.365	78.8	70 - 130				

MS		Sample ID: HS21120909-01MS		Units: ug/L		Analysis Date: 23-Dec-2021 20:07				
Client ID:		Run ID: ICPMS06_398310		SeqNo: 6439068		PrepDate: 23-Dec-2021		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	52.31	2.00	50	2.091	100	70 - 130				
Nickel	49.52	2.00	50	0.937	97.2	70 - 130				

MSD		Sample ID: HS21120909-07MSD		Units: ug/L		Analysis Date: 23-Dec-2021 20:15				
Client ID:		Run ID: ICPMS06_398310		SeqNo: 6439072		PrepDate: 23-Dec-2021		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	51.62	2.00	50	4.038	95.2	70 - 130	44.7	14.4	20	
Nickel	47	2.00	50	0.365	93.3	70 - 130	39.75	16.7	20	

Client: ARCADIS U.S., Inc.
Project: 30109309 EQ Tulsa
WorkOrder: HS21120607

QC BATCH REPORT

Batch ID: 173915 (0) **Instrument:** ICPMS06 **Method:** TOTAL METALS BY E200.8, REV 5.4, 1994

MSD		Sample ID: HS21120909-01MSD		Units: ug/L		Analysis Date: 23-Dec-2021 20:09				
Client ID:		Run ID: ICPMS06_398310		SeqNo: 6439069		PrepDate: 23-Dec-2021		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	51.42	2.00	50	2.091	98.7	70 - 130	52.31	1.71	20	
Nickel	48.2	2.00	50	0.937	94.5	70 - 130	49.52	2.69	20	

The following samples were analyzed in this batch:

HS21120607-01	HS21120607-02	HS21120607-03	HS21120607-04
HS21120607-05	HS21120607-06	HS21120607-07	

Client: ARCADIS U.S., Inc.
Project: 30109309 EQ Tulsa
WorkOrder: HS21120607

**QUALIFIERS,
ACRONYMS, UNITS**

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

<u>Acronym</u>	<u>Description</u>
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

<u>Unit Reported</u>	<u>Description</u>
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	21-022-0	26-Mar-2022
Florida	E87611-33	30-Jun-2022
Illinois	2000322021-7	09-May-2022
Kansas	E-10352 2021-2022	31-Jul-2022
Kentucky	123043, 2021-2022	30-Apr-2022
Louisiana	03087, 2021-2022	30-Jun-2022
North Carolina	624-2021	31-Dec-2021
Texas	T104704231-21-28	30-Apr-2022

Sample Receipt Checklist

Work Order ID: HS21120607

Date/Time Received: **10-Dec-2021 10:10**

Client Name: AGM-OK

Received by: **Pablo Marinez**

Completed By: <u>/S/ Pablo Marinez</u>	10-Dec-2021 14:35	Reviewed by: <u>/S/ Corey Grandits</u>	27-Dec-2021 13:54
eSignature	Date/Time	eSignature	Date/Time

Matrices: **WATER**

Carrier name: **FedEx Priority Overnight**

- | | | | |
|---|---|-----------------------------|---|
| Shipping container/cooler in good condition? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | Not Present <input type="checkbox"/> |
| Custody seals intact on shipping container/cooler? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | Not Present <input type="checkbox"/> |
| Custody seals intact on sample bottles? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Not Present <input checked="" type="checkbox"/> |
| VOA/TX1005/TX1006 Solids in hermetically sealed vials? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Not Present <input checked="" type="checkbox"/> |
| Chain of custody present? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | 1 Page(s) |
| Chain of custody signed when relinquished and received? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | COC IDs:255889 |
| Samplers name present on COC? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| Chain of custody agrees with sample labels? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| Samples in proper container/bottle? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| Sample containers intact? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| Sufficient sample volume for indicated test? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| All samples received within holding time? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| Container/Temp Blank temperature in compliance? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |

Temperature(s)/Thermometer(s):	0.7°C UC/C	IR 31
Cooler(s)/Kit(s):	47873	
Date/Time sample(s) sent to storage:	12/10/21 14:40	

- | | | | |
|--|---|--|--|
| Water - VOA vials have zero headspace? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | No VOA vials submitted <input checked="" type="checkbox"/> |
| Water - pH acceptable upon receipt? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | N/A <input type="checkbox"/> |
| pH adjusted? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> | N/A <input type="checkbox"/> |

pH adjusted by:

Login Notes:

Client Contacted: _____ Date Contacted: _____ Person Contacted: _____

Contacted By: _____ Regarding: _____

Comments:

Corrective Action:



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Everett, WA
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Holland, MI
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Chain of Custody Form

Page 1 of 1

COC ID: 255889

HS21120607

ARCADIS U.S., Inc.
30036303 EQ Tulsa



ALS Project Manager:

Customer Information		Project Information		ALS Project Manager:											
Purchase Order	30109309 Task 02	Project Name	30109309 EQ Tulsa	A	200.8 (Total Arsenic and Nickel)										
Work Order		Project Number	30109309 Task 02	B	200.8_Diss (Dissolved Arsenic and Nickel - Lab Filter)										
Company Name	ARCADIS U.S., Inc.	Bill To Company	ARCADIS	C	FILTRATION - METALS										
Send Report To	Thomas Kolb	Invoice Attn	Accounts Payable	D											
Address	5100 East Skelly Drive, Suite #40	Address	630 Plaza Drive, Suite 600	E											
				F											
City/State/Zip	Tulsa, OK 74135	City/State/Zip	Highlands Ranch CO 80129	G											
Phone	(918) 664-9900	Phone	(303) 471-3699	H											
Fax	(918) 664-9925	Fax		I											
e-Mail Address	Thomas.Kolb@arcadis.com	e-Mail Address	Accountspayable.administration@arcadi												

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-15	12-9-21	1000	Groundwa	2,8	2	X	X	X								
2	MW-19	12-9-21	1040	Groundwa	2,8	2	X	X	X								
3	MW-12	12-9-21	1130	Groundwa	2,8	2	X	X	X								
4	MW-18	12-9-21	1200	Groundwa	2,8	2	X	X	X								
5	MW-17	12-9-21	1240	Groundwa	2,8	2	X	X	X								
6	MW-20	12-9-21	1220	Groundwa	2,8	2	X	X	X								
7	MW-16	12-9-21	1300	Groundwa	2,8	2	X	X	X								
8																	
9																	
0																	

Sampler(s) Please Print & Sign
Larry Cook
 Relinquished by: *Larry Cook* Date: 12-9-21 Time: 1600
 Relinquished by: *[Signature]* Date: 12/10/21 Time: 10:10
 Logged by (Laboratory):
 Date: Time: Received by (Laboratory):
 Checked by (Laboratory):

Shipment Method: **FedEx**
 Required Turnaround Time: (Check Box)
 STD 10 Wk Days 5 Wk Days 2 Wk Days 24 Hour
 Results Due Date:

Notes: **AGM EQ Tulsa**

Cooler ID	Cooler Temp.	QC Package: (Check One Box Below)	
47873	0.7C	<input checked="" type="checkbox"/> Level II Std QC	<input type="checkbox"/> TRRP Checklist
		<input type="checkbox"/> Level III Std QC/Raw Data	<input type="checkbox"/> TRRP Level IV
		<input type="checkbox"/> Level IV SW046/CLP	
		<input type="checkbox"/> Other	

reservative Key: 1-HCl 2-HNO₃ 3-H₂SO₄ 4-NaOH 5-Na₂S₂O₃ 6-NaHSO₄ 7-Other 8-4°C 9-5035

te: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
 2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
 3. The Chain of Custody is a legal document. All information must be completed accurately.

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Houston, Texas 77099
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Fax. +1 281 530687
47673

CUSTODY SEAL
Date: 12.9.21 Time: 16:00
Name: [Signature]
Company: [Signature]

Seal Broken By: PM
Date: 12/10/21

FedEx
TRK# 0221 5300 5225 5760

FRI - 10 DEC 11:30A
PRIORITY OVERNIGHT

AB SGRA 47673

77099
TX--US IAH
EXP 10/22



#4270031 12/09 56DJ3/E934/FE4R

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